

Tungsten

W

74

TUNGSTEN

Element Symbol: **W**

Atomic Number: **74**

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LEONIE OAKES

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Spanish brothers Fausto and Juan Jose d'Elhuyar discovered in 1783 that the reduction of wolframite acid using charcoal resulted in the purification of the element tungsten. The name is derived from Swedish "tung sten" meaning "heavy stone". Wolframite is the main tungsten ore mineral and its name is the origin of the element's symbol "W". China produces the majority of the world's tungsten which is generated from wolframite and scheelite, tungsten ore minerals found in the earth.

The most well-known use of tungsten is in incandescent light bulbs. They were a landmark invention decades ago but are now obsolete as they have been replaced by the much more energy efficient fluorescent bulbs. Incandescent light bulbs that do not meet minimum energy performance standards are banned from sale in Australia. Still available are incandescent halogen light bulbs which are more energy efficient (due to the halogen cycle), so tungsten isn't quite out of the lighting market yet!

Tungsten is a remarkable metal as it has the highest melting point, lowest vapour pressure and highest tensile strength than any other metal in pure form. It is also one of the densest and is therefore used widely in alloys and steels for producing small, heavy objects like fishing sinkers, weights and counterweights. Tungsten alloys are also commonly used in all sorts of weaponry. Since tungsten can handle a lot of heat, superalloys containing the element are used in turbine blades and engine valves. Tungsten is highly conductive making it suitable for some electrical applications as well. It also happens to be the heaviest element with a known biological role (in some prokaryotic enzymes).

Tungsten is used extensively as tungsten carbide, a VERY hard material used in wear-resistant cutting tools and drills that cut other metals or rock. Tungsten carbide is therefore very important to the metal-working and mining industries. The carbide is also present in the balls of ballpoint pens and in the drill bits used by your friendly neighbourhood dentist. It is also becoming a popular choice of material for men's wedding rings due to its hardness and scratch resistance.

The future of tungsten applications may be dim however as recent research indicates it could be much more toxic than previously thought. It seems there is still a great deal of research to be done on this tough, though lustrous element.

Provided by the element sponsor sponsorAnna Molnar

ARTISTS DESCRIPTION

To represent Tungsten I have used an image of the light bulb. The faded nature of the image is indicative of the obsolete nature of the Tungsten bulb being replaced in Australia with more energy efficient bulbs. The image combines traditional etching on copper and solar plate.

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